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ABSTRACT:

PURPOSE: To transfer the picture of a speaker only and to protect the privacy of the speaker by storing the picture to be displayed by replacing the background of the current picture, and processing the background picture other than the speaker.

CONSTITUTION: A speaker inputs a background input key so as to stores a background picture to be erased in a background picture memory 14 and stores the picture of the speaker himself in a current picture memory 15 by inputting a confirmation key after displaying the picture of the speaker himself on the screen of a display monitor 10. In addition, the speaker stores a previously prepared picture to be used for replacing the background picture in a replacing picture memory 16. Thereafter, a one-chip microcomputer 11 executes a program stored in a background process controlling program ROM 17 and sends aimed picture element data to a telephone line after writing the picture element data

into a picture memory 5. Since the background of a speaker is replaced with a previously prepared another picture in such way, the privacy of the speaker can be kept and the picture of the speaker himself can be contrasted with the background.

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㊹発明の名称　静止画テレビ電話機

㉑特　願　昭63−281269
㉒出　願　昭63(1988)11月9日

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明　細　書

1. 発明の名称

静止画テレビ電話機

2. 特許請求の範囲

静止画像を電話回線を使用して送受信する静止画テレビ電話機において、話者を含めた画像を記憶する現在画像メモリと、背景のみを記憶する背景画像メモリと、現在の画像の背景に置き換えて表示させる画像を記憶した置き換え画像メモリと、前記現在画像メモリの通話者以外の背景画像の処理手順を記憶する背景処理制御プログラムROMと、静止画テレビ電話機のシステムバスを介して前記背景処理制御プログラムにしたがつて前記各画像メモリを制御して画像データを生成するワンチップマイクロコンピュータとを備えたことを特徴とする静止画テレビ電話機。

3. 発明の詳細な説明

〔産業上の利用分野〕

本発明は、電話回線を使用して静止画像を送受信する静止画テレビ電話機に関するものである。

〔従来の技術〕

従来の静止画テレビ電話機では、ビデオカメラから入力された画像をそのまま送信しているため、通話者の上半身等の画像の他に静止画テレビ電話機が設置された室内の背景も写し出される。

〔発明が解決しようとする課題〕

一般に電話機による会話では、通話者のみの画像転送で十分であり、かつ通話者のプライバシーを保護する必要から通話者以外の画像の送信を避けたいと言う要求がある。

〔課題を解決するための手段〕

本発明の静止画テレビ電話機は、前述した従来の問題を改善するためになされたものであり、通話者を含めた画像を記憶する現在画像メモリと、背景のみを記憶する背景画像メモリと、現在の画像の背景に置き換えて表示させる画像を記憶した置き換え画像メモリと、前記現在画像メモリの通話者以外の背景画像の処理手順を記憶する背景処理制御プログラムROMと、静止画テレビ電話機のシステムバスを介して前記背景処理制御プログラ

ムに従い前記各画像メモリを制御して画像データを生成するワンチップマイクロコンピュータとを有している。

〔作用〕

本発明においては、通話者以外の背景が消去もしくは他の画像に置き換えられる。

〔実施例〕

以下、図面を用いて本発明の実施例を詳細に説明する。

第１図は本発明の一実施例による静止画テレビ電話機の構成を示すブロック図である。同図において、１は電話回線、２は直流分離回路、３は変復調回路、４はシステムバス、５は画像メモリ、６は背景制御回路、７はA/D回路、８はビデオカメラ、９は表示制御回路、１０はディスプレイモニタ、１１はワンチップマイクロコンピュータ、１２はキースイッチレジスタ、１３はキーパッドである。

第２図は第１図の背景制御回路６の構成を示すブロック図である。同図において、１４は背景画

像メモリ、１５は現在画像メモリ、１６は置き換え画像メモリ、１７は背景処理制御プログラムROMである。

まず、従来の静止画テレビ電話機における静止画像の送信動作について説明する。第１図において、背景制御回路６を除いた構成が、従来の静止画テレビ電話機の回路構成である。ビデオカメラ８からのビデオ信号は、A/D回路７により画素ごとに輝度の重み付けをされた画素データに変換され、画像メモリ５に記憶される。画像メモリ５の画素データは表示制御回路９の表示タイミングに同期して読み出されてビデオ信号に変換され、ディスプレイモニタ１０に与えられることにより画面表示される。

通話者が静止画像を転送するため、送信キーをキーパッド１３から入力すると、キースイッチレジスタ１２を介してワンチップマイクロコンピュータ１１がこれを検出し、A/D回路７から画像メモリ５への画素データの転送を中止する。これによりディスプレイモニタ１０の画面には転送する

静止画像が表示される。同時に、ワンチップマイクロコンピュータ１１は画像メモリ５から送信タイミングに同期して画素データを読み出し、変復調回路３に転送することにより、静止画像データが直流分離回路２を介して電話回線１に送信される。

次に本発明に係る背景制御回路６による背景画像の置き換え動作を第２図を用いて説明する。まず、通話者は背景入力キーを入力して消去すべき背景画像を背景画像メモリ１４に記憶させる。次に通話者自身をディスプレイモニタ１０の画面に表示させ、確認キーを入力し、その画面を現在画像メモリ１５に記憶する。また、本実施例では、背景画像を通話者があらかじめ用意した画像に置き換えることができ、そのための画像を前もつて置き換え画像メモリ１６に記憶させておく。

以上の準備が整つた後、ワンチップマイクロコンピュータ１１は、背景処理制御プログラムROM１７に記憶させているプログラムを実行し、第３図にステップ101～109で示すフローチャートの

処理を行ない、目的の画素データを画像メモリ５に書き込む。以下この画素データを電話線に送出する動作は従来の静止画テレビ電話機と同一である。

なお、背景画像の抽出と置き換えの手法は、背景処理制御プログラムROM１７に記憶されたプログラムコードにより変更可能であり、第３図のフローチャートの手法のみでないことは言うまでもない。

〔発明の効果〕

以上説明したように本発明によれば、不必要な背景画像を削除したり他の画像に置き換えることにより、個人のプライバシーを確保でき、かつ通話者独自の背景を使用し通話者自身の画像を際立たせる効果が得られる。

4. 図面の簡単な説明

第１図は本発明の一実施例による静止画テレビ電話機の構成を示すブロック図、第２図は背景制御回路の詳細な構成を示すブロック図、第３図は背景処理制御プログラムROMに記憶されているプ

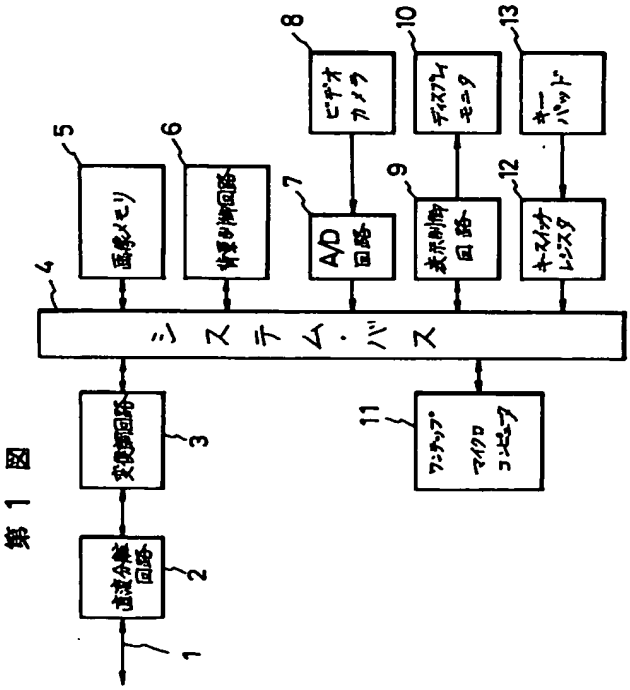
ログラムのフローチャートである。

1・・・・電話回線、2・・・・直流分離回路、3・・・・変復調回路、4・・・・システムバス、5・・・・画像メモリ、6・・・・背景制御回路、7・・・・A/D回路、8・・・・ビデオカメラ、9・・・・表示制御回路、10・・・・ディスプレイモニタ、11・・・・ワンチップマイクロコンピュータ、12・・・・キースイッチレジスタ、13・・・・キーパッド、14・・・・背景画像メモリ、15・・・・現在画像メモリ、16・・・・置き換え画像メモリ、17・・・・背景処理制御プログラムROM。

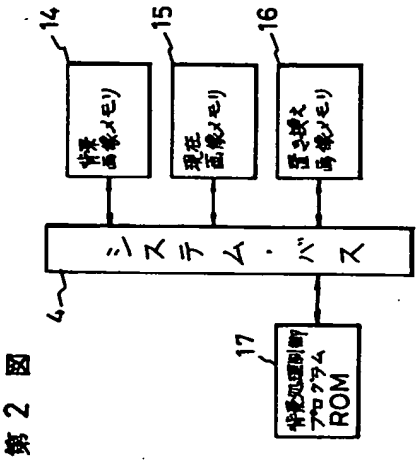
特許出願人　日本電気株式会社

代理人　山川政樹（ほか2名）

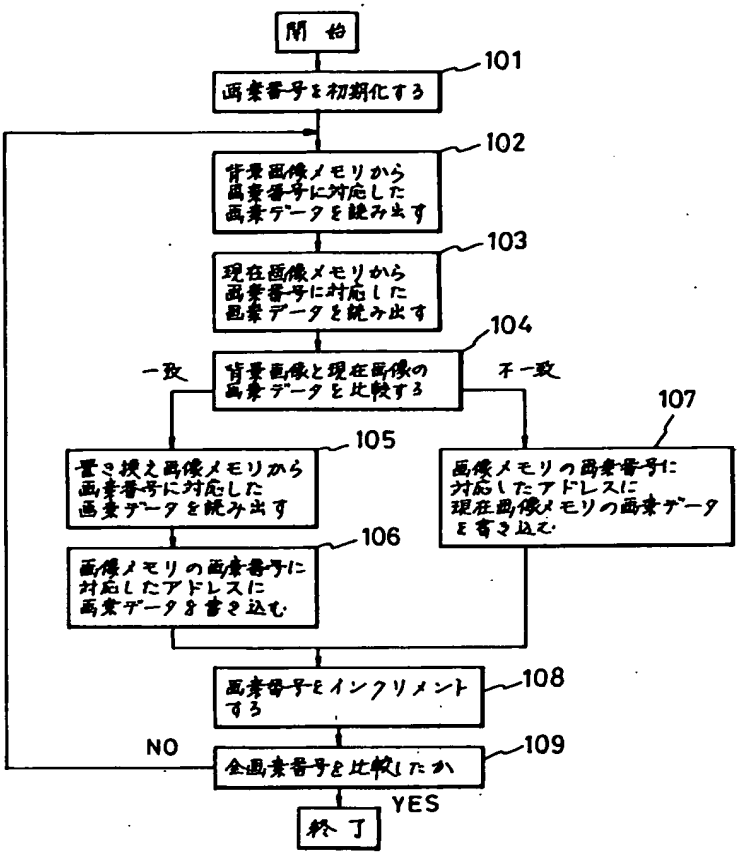
第1図



第2図



第 3 図


開始
101
画素番号を初期化する
102
背景画像メモリから
画素番号に対応した
画素データを読み出す
103
現在画像メモリから
画素番号に対応した
画素データを読み出す
104
背景画像と現在画像の
画素データを比較する
一致
不一致
105
置き換え画像メモリから
画素番号に対応した
画素データを読み出す
106
画像メモリの画素番号に
対応したアドレスに
画素データを書き込む
107
画像メモリの画素番号に
対応したアドレスに
現在画像メモリの画素データ
を書き込む
108
画素番号をインクリメント
する
109
全画素番号を比較したか
NO
YES
終了

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention relates to the virtual society realization system which offers the place of an alternating current of imagination [with passage, pictorial-communication technology, and speech-communication technology] of a communication network to two or more human beings
[0002]
[Description of the Prior Art] The teleconference with voice is realized as a conventional analogous system. Moreover, using pictorial-communication technology, at the so-called TV conference, among two or more points, a picture is sent, it suits, the picture of a television machine is divided, and the method which displays two or more screens there simultaneously, and the method displayed on two or more television machines of airraid correspondence are taken.
[0003]
[Problem(s) to be Solved by the Invention] in the above-mentioned conventional technology, an alternating current in the same place as the partner who wants to alternate mutually cannot be performed, and there is a problem that the number of points is restricted, by communication between polytopic points again
[0004] As the purpose of this invention is whether two or more alternating human beings gathered in one place, it is to offer the virtual society realization system with an eye on losing human being's number of limits which the alternating current which led can be performed and interchange conversation and a gesture.
[0005]
[Means for Solving the Problem] The virtual society realization system of this invention consists of two or more terminal units and service center equipment connected with them through the communication line. each terminal unit The image pck-up equipment which picturizes the person image of the terminal user concerned, and the transmitter which inputs this user's voice, The input unit which inputs the control information by this user, and the sending set which transmits the aforementioned user's person video signal, a sound signal, and control information to center equipment, The receiving set which receives the synthetic video signal which the aforementioned center equipment transmits, and a mixed sound signal, It has the television equipment which outputs the synthetic video signal which carried out [aforementioned] reception, and the transmitter which outputs a mixed sound signal. service center equipment The source of a background image which accumulates two or more background video signals, and the background sound source which accumulates two or more background correspondence numbers, The receiving set which receives the person video signal, the sound signal, and control information which each aforementioned terminal unit transmits, The image synthesizer unit which compounds the person video signal from each aforementioned terminal unit, and the background video signal chosen from the aforementioned source of a background video signal, The voice mixture equipment which mixes the sound signal from each aforementioned terminal unit, and the background correspondence number chosen from the aforementioned background sound source, The distribution apparatus which distributes the aforementioned synthetic video signal and a mixed sound signal to each terminal unit, The control information from each aforementioned terminal unit is analyzed, and it is characterized by having the control unit which performs control of image composition of the selection control of the background video signal from the aforementioned source of a background image, and a background sound source, or a background correspondence number, the aforementioned image synthesizer unit, and voice mixture equipment, or voice mixture.
[0006]
[Function] A user's image and voice which are in front of each terminal unit are changed into a video signal and a sound signal by image pck-up equipment and the transmitter, and are sent out to a communication network by them, respectively. each of this user's image and sound signal are sent to service center equipment, are compounded with a background image and background sound there, and are **** about the imagination world "virtual society" -- ** Through a communication network, this image and voice of "virtual society" that were compounded are sent to each user's terminal unit, and are reproduced by television equipment and the earphone.
[0007]
[Example] Hereafter, a drawing explains one example of this invention.
[0008] Drawing 1 is the conceptual diagram of the whole virtual society realization system of this invention, and terminal units 1, 2, and 3 being connected with service center equipment 4 through a communication network 5, and receiving service

of virtual society is shown. In this example, although the example of three sets of terminals is shown, this invention does not limit the number of terminals.

[0009] Drawing 2 is the example of composition of each terminal units 1, 2, and 3, and consists of control information input units 15, such as the earphones 14, such as the television equipments 13, such as the transmitters 12, such as the image pck-up equipments 11, such as a television camera, and a microphone, and a display, and a loudspeaker, a keyboard, and a mouse, and a transmitter-receiver 16 containing a sign / decryption section 161.

[0010] Here, the control information input unit 15 is used for the input of the following control information.

(1) It uses for selection of "virtual society." Thereby, a user can choose favorite "society" out of two or more "virtual society" prepared for service center equipment.

(2) Use in order to choose on which position of the space which "virtual society", i.e., a background image, and background sound make a user image is put. By this, a user can move about in "virtual society."

(3) When returning a user image to the user concerned, use for choosing whether it considers as an image as it is, or it considers as a silhouette image.

(4) Use for the directions for expanding a specific partner's image (image of a rise), enlarging [voice / of a partner] alternatively, and there being small other voice. Conversation with a specific partner is attained by this.

[0011] Drawing 3 is the example of composition of service center equipment 4. The transmitter-receiver 41 containing the sign / decryption sections 411, 412, and 413 for multiple channels (this example three channels), the image synthesizer unit 42 which compounds two or more video signals, the image distribution apparatus 43 which distributes a synthetic video signal to a multiple channel, and two or more sound signals the voice mixture equipment 44 to mix, the voice distribution apparatus 45 which distributes a mixed sound signal to a multiple channel, the source 46 of a background image which accumulates two or more background video signals, the background sound source 47 which accumulates two or more background sound signals, and the positional information storage 48 which stores each one of positional information for every background -- and It consists of a control unit 49 which analyzes the control information from a terminal unit side, and controls each equipment. In addition, as for a video-signal bus and 440, 420 is [a sound signal bus and 490] control signal buses.

[0012] First, basic operation of this system is explained. Now, Users A, B, and C presuppose that terminal units 1, 2, and 3 are used, respectively. Moreover, each user shall picturize against the background of the wall of monochrome solid color. As a color of the wall of a background, "blue" is desirable. This is for making easy to do image composition by the below-mentioned chroma-key processing.

[0013] Each terminal units 1, 2, and 3 input the "virtual society" selection information with which change into a video signal and a sound signal each users' A, B, and C image and voice (it is called user image in which this was summarized) with image pck-up equipment 11 and a transmitter 12, respectively, and a user specifies them to be as control information from the control information input unit 15, and transmit these video signals, a sound signal, and control information to service center equipment 4 through a communication network 5 from a transmitter-receiver 16. A sign / decryption section 161 is contained in the transmitter-receiver 16, and it compresses in order to transmit a video signal, a sound signal, and control information efficiently.

[0014] With service center equipment 4, the video signal which each terminal units 1, 2, and 3 transmit, a sound signal, and control information are received by the transmitter-receiver 41, and it decodes by each sign / decryption section 411, 412, and 413, separates into a video signal, a sound signal, and control information, and sends to the image synthesizer unit 42, voice mixture equipment 44, and a control unit 49 through the video-signal bus 420, the sound signal bus 440, and the control signal bus 460, respectively. A control unit 49 analyzes control information, chooses from the source 46 of a background image, and the background sound source 47 the background video signal and background correspondence number corresponding to the "virtual society" which the user specified, respectively, and sends them to the image synthesizer unit 42 and voice mixture equipment 44. Furthermore, a control unit 49 sends the positional information of each users A, B, and C corresponding to the virtual society concerned to the image synthesizer unit 42 with reference to the positional information memory 48. In addition, the value or any value beforehand specified by the user is stored in the positional information memory 48. According to each user's positional information, the image synthesizer unit 42 compounds each user's video signal and background video signal, and sends them to the image distribution apparatus 43. Voice mixture equipment 44 mixes each user's sound signal and background correspondence number, and sends them to the voice distribution apparatus 45. The image distribution apparatus 43 and the voice distribution apparatus 45 distribute the picture signal compounded, respectively and the mixed sound signal to a sign / decryption sections 411, 412, and 413. A sign / decryption sections 411, 412, and 413 encode a synthetic picture signal and a mixed sound signal, respectively, and transmit to terminal units 1, 2, and 3.

[0015] In each terminal units 1, 2, and 3, a synthetic picture signal and a mixed sound signal are received by the transmitter-receiver 16, it decodes by its sign / decryption section 161, and a synthetic video signal and a mixed sound signal are separated. Television equipment 13 projects a synthetic picture and an earphone 14 outputs mixed voice. Consequently, it can talk and the users A, B, and C who are in front of each terminals 1, 2, and 3 can alternate, as met in the same place.

[0016] Next, various kinds of methods of realizing image composition are explained. Now, each users A and BC presuppose that the position is chosen so that it may stand in a line in order of A, B, and C from the left toward a background image. In this case, according to the directions from a control unit 49, the image synthesizer unit 42 compounds each user's video signal and background image by chroma-key processing, as shown in (1) of drawing 4 . In this state, if each users A, B, and C choose a silhouette image as the method of presentation of their image with the control information input unit 15, this control

information will be told to a control unit 49, and will serve as instructions to the image synthesizer unit 42. In case the image synthesizer unit 42 compounds each user's image and background image, it changes an applicable user's image into a silhouette image. In transform processing to a silhouette image, methods, such as making into black level the portion extracted by the chroma-key, and the method by the fixed pattern of the source of a silhouette image prepared separately can be considered. The synthetic image corresponding to each terminals 1, 2, and 3 in the case of being based on a fixed pattern (2) of drawing 4 , (3), and (4) is shown.

[0017] Moreover, when a certain user directs to move one's position with the control information input unit 15 (for example, the move direction, distance, etc. are directed with a mouse etc.), this is told to a control unit 49, and a control unit 49 updates the positional information of the applicable user in the positional information memory 48, and considers it as the position instructions to the image synthesizer unit 42. [in a background image] The image synthesizer unit 42 moves to the position which had an applicable user's video signal specified according to these position instructions, and compounds with other users' video signal by chroma-key processing. Moreover, if the image synthesizer unit 42 is ordered expansion of the image and visual field of the user who a control unit 42 calculates the relative-position relation between the user to whom movement was directed with reference to the positional information memory 48, and other users, and approaches at this time, movement of a certain user's image can be followed, and a specific partner's image and visual field can also be expanded and (rise image) compounded.

[0018] Next, various kinds of methods of realizing voice mixture are explained. As now shown in drawing 4 , when Users A, B, and C have stood in a line in order of A, B, and C from the left, voice mixture equipment 44 adjusts each user's vocal sound level like this arrangement. In this case, although size-related adjustment is sufficient when a voice channel is a monophonic recording, in the case of a stereo, the voice distributed to right and left is adjusted. Moreover, it is made not to return a user's voice own [a certain] to the user. Furthermore, when a specific partner's image and visual field are expanded, only this partner's sound signal is enlarged alternatively and other sound signals are made small. These control is the instructions from a control unit 49, and is performed synchronizing with image composition.

[0019]

[Effect of the Invention] According to the virtual society realization system of this invention, as met in the same place, the user of a large number which are present in a remote place can talk, and can alternate in a natural form. Thus, this invention system gives the new system gestalt for the alternating current with people and a man.

[Translation done.]